

IN THE UNITED STATES
PATENT AND TRADEMARK OFFICE

Appl. No. : 10/797,791
Applicants : Thomas DUERBAUM et al.
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Examiner : Rajnikant B. PATEL
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Title: RESONANT CONVERTER

REPLY BRIEF

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Sir:

In response to the Examiner's Answer dated 3 September 2008, and in support of the Notice of Appeal filed on 18 December 2007, Applicants hereby respectfully submit this Reply Brief.

ARGUMENTS

(1) Claims 9 and 16 are Patentable over Liu

Claim 9

Among other things, in the resonant converter of claim 9 different ratios of a magnitude of output voltage to number of turns are provided in respect of associated secondary windings having different winding directions.

In the Examiner's Answer, the Examiner states that:

"The different ratio of output voltage (12, -12) to number of turns (turns are same for both (n), since voltage magnitude is the same (12)) is different since one ratio positive (12/n), the other is negative (-12/n) (sic throughout.)"

Once again, the Examiner reads out of claim 9 a plainly recited feature – namely that different ratios of a magnitude of output voltage to number of turns are provided in respect of associated secondary windings having different winding directions. So claim 9 does not recite "*different ratio of output voltage to number of turns*" as mentioned by the Examiner.

The undersigned attorney hardly thinks that he should have to mention to the board that the magnitudes of (12/n) and (-12/n) – cited by the Examiner - are indeed exactly the same – not "different" as clearly recited in claim 5.

Therefore, the undersigned attorney believes the Board will have little difficulty understanding why this rejection is in error.

Also, in the **Response to Argument** section on Page 9 of the Examiner's Answer, the Examiner states:

"The examiner respectfully disagrees because the final office action mailed on 28 December 2007 does not include an official notice taken in the 102 rejection. With respect to the Official notice mentioned in the argument of the Final rejection was to clarify the 102 rejection (sic throughout.)"

So did it include an official notice, or did it not include an official notice?

Reproduced below is the text in question from page 2 of the FINAL Office Action of 28 December 2007:

As to the argument related to claim 9, Liu et al. disclose the both limitation the secondary winding has different direction as well as a different ratio of a magnitude of output voltage, since Liu et al. discloses claimed subject matters except the number of turn. It would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize same end result since examiner takes official notice of the equivalence of a different ratio of a magnitude of output voltage for their use in the applied art and selection of any of these equivalents to desire output would be within level of ordinary skill in the art. In regards to claim 31, a measuring signal for regulating

From this text, it not only appears that the Examiner is taking official notice, but it also appears that he is introducing obviousness into a rejection under 35 U.S.C. § 102.

Again, Applicants traverse the Official Notice, and because no evidence has been offered in support, Applicants also respectfully request that it be withdrawn.

The Examiner then goes on to state that it is "*elementary knowledge that if the output voltage of a plurality (sic) secondary winding (sic) have different output voltage, it means the number of turns are different*" and that "*[o]ne of ordinary skill in the art would have found that to be inherent in the applied art of Liu et al.*"

Again, by mentioning what he considers to be "elementary knowledge" without any citation or support in the references, Applicants respectfully submit that the Examiner is taking Official Notice.

Furthermore, Applicants submit that the Examiner's "inherency" argument is in error and cannot meet the test of In re Robertson, 169 F.3d 743, 745, 49 USPQ2d 1949, 1950-51 (Fed. Cir. 1999). And even if the Examiner's contention was true, that would not mean that Liu discloses what is claimed in claim 9. The Examiner argues that if the output voltage is different, the number of turns must be different.

Applicants claim a resonant converter – not merely a transformer. In Applicants'

resonant converter of claim 9, different ratios of a magnitude of output voltage to number of turns of the secondary winding of a transformer are provided in respect of secondary windings having different winding directions. In some embodiments of such a resonant converter, if the output voltages of the resonant converter are different, it may nevertheless be true that the number of turns is the same! An exemplary embodiment is illustrated at page 5, lines 1-31, where it is explained that the output voltages U_a and U_b can be adjusted by adjusting the duty cycle of AC voltage U_s . Compare, for example, the curves of I_a and I_b in FIGs. 5 and 6, where only the duty cycle of U_s has changed – not the number of turns of the secondary side of transformer 4).

Finally, the Examiner writes:

"Further in regards to Appellant's argument that Liu et al. just does not disclose a resonant (sic)."

That is not what the undersigned attorney wrote. Again, the Examiner omits words that affect meaning. The undersigned attorney wrote:

"Liu just does not disclose a resonant (sic) where different ratios of a magnitude of output voltage to number of turns are provided in respect of associated secondary windings having different winding directions"

(emphasis added).

The undersigned attorney apologizes for the omission of the word "converter" after "resonant" in that text. Nevertheless, the undersigned attorney believes that the Board can easily understand what is meant.

In conclusion, Liu just does not disclose a resonant converter where different ratios of a magnitude of output voltage to number of turns are provided in respect of

associated secondary windings having different winding directions.

Accordingly, for at least these reasons, Applicants respectfully submit that claim 9 is patentable under 35 U.S.C. § 102 over Liu.

Claim 16

Claim 16 depends from claim 9 and is patentable over Liu for at least the reasons set forth above with respect to claim 9.

(2) Claims 5 and 31 Are Patentable Over Liu and Raets

Claim 5

Among other things, the resonant converter of claim 5 includes an inverter in series with a capacitive element, an external inductive element, and the primary winding of the transformer.

The Office Action fairly admits that Liu does not disclose such an arrangement. However, the Office Action states that Raets discloses such an arrangement, and that it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Liu to include Raets' arrangement.

The Examiner states that there must be some reason why one skilled in the art would be motivated to make the proposed combination of references, but that there is no requirement that a motivation to make the modification be expressly articulated.

However, a rejection on obviousness grounds under 35 U.S.C. § 103 cannot be sustained by mere conclusory statements: instead there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness. In re Kahn, 441 F.3d 977, 988, 78 USPQ2d 1329, 1336 (Fed. Cir. 2006). See also KSR International Co. v. Teleflex Inc., 550 U.S. ___, 82 USPQ2d 1385, 1396 (2007) (quoting Federal Circuit statement with approval).

Here, the Examiner offers nothing but an unsupported conclusory statement that "*the two topology (sic) were art-recognized equivalents at the time the invention was made.*" The Examiner offers absolutely no evidence that anyone of skill in the art at the time the invention was made would have recognized anything in Raets to

be a substitutable equivalent of anything in Liu.

Indeed, Applicants respectfully submit that the proposed modification of Liu's device would not make sense. The principal object of Liu's invention is to achieve a reduction in radiated EMI (see, e.g., Abstract; col. 1, lines 8-67) On the other hand, it seems that replacing Liu's combination of gate filter 30, switching circuit 20, capacitor 26 and inductor 18 with Raets' arrangement with its multiple switching devices would necessarily increase the radiated EMI. Thus, the proposed combination would destroy Liu's object and therefore would never have been obvious to one of ordinary skill in the art at the time the invention was made.

Accordingly, for at least these reasons, Applicants respectfully submit that claim 5 is patentable over the cited prior art.

Claim 31

Among other things, the resonant converter of claim 31 includes a regulating circuit for deriving from each of the multiple outputs a measuring signal for regulating an output voltage of the inverter.

Applicants respectfully submit that no combination of the cited art would produce a resonant converter including such a feature.

Applicants respectfully submit that Liu and Raets do not disclose the claimed regulating circuit for deriving from each of the multiple outputs a measuring signal for regulating an output voltage of the inverter.

Furthermore, the Examiner does not allege that Liu or Raets or any combination thereof discloses the claimed regulating circuit for deriving from each of the multiple outputs a measuring signal for regulating an output voltage of the inverter.

Indeed, the Examiner makes absolutely no mention of the regulating circuit for deriving from each of the multiple outputs a measuring signal for regulating an output voltage of the inverter that is plainly recited in claim 31.

Therefore, Applicants respectfully submit that the Examiner has failed to even establish a *prima facie* case of obviousness under 35 U.S.C. § 103.

Also, in the **Response to Argument** section on page 10 of the Examiner's Answer, the Examiner states:

"Appellant's argument with respect to applied art of Raets does not disclose multiple output, (sic) the examiner respectively (sic) disagrees because Raets's figure 1 clearly discloses three output (sic)."

Yet again, the Examiner omits words that affect meaning. What Applicants actually wrote was:

"Raets' control circuit 20 does not even receive multiple outputs of a resonant converter"

(emphasis added).

Indeed, this is apparent from inspecting FIG. 1 of Raets, where it is seen that the voltages V1 and V2 are not supplied to control circuit 20. So again, Raets cannot supply this feature of claim 31 to Liu.

Finally, in the **Response to Argument** section on page 10 of the Examiner's Answer, in discussing the rejection of claim 31, the Examiner mysteriously mentions Steigerwald. However, the Examiner did not cite Steigerwald in rejecting claim 31, nor does he now explain on what basis it is supposed to be combined with Liu and Raets.

Accordingly, for at least these reasons, Applicants respectfully submit that claim 31 is patentable over the cited art.

(3) Claims 11-13, 17-18, 25-27 and 32-34 Are All Patentable
Over Liu, Raets, Steigerwald and Marson

At the outset, Applicants note that claims 11-13, 17-18, 25-27 and 32-34 depend variously from claims 5 and 31. Applicants also submit that Steigerwald and

Marson do not remedy the shortcomings of Liu and Raets as set forth above with respect to claims 5 and 31. Therefore, claims 11-13, 17-18, 25-27 and 32-34 are deemed patentable over any combination of Liu, Raets, Steigerwald and Marson for at least the reasons set forth above with respect to claims 5 and 31.

Applicants again respectfully traverse the proposed combination of references.

It is well established that a rejection under 35 U.S.C. § 103 cannot be sustained merely by the conclusory statements of an Examiner. M.P.E.P. § 2142 provides that:

"The Federal Circuit has stated that "rejections on obviousness cannot be sustained with mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness." In re Kahn, 441 F.3d 977, 988, 78 USPQ2d 1329, 1336 (Fed. Cir. 2006). See also KSR, 550 U.S. at __, 82 USPQ2d at 1396 (quoting Federal Circuit statement with approval)."

No such articulated reasoning or rational underpinnings have been provided here.

Here, the Examiner makes the conclusory statement that it would have been obvious to modify Liu and Raets as proposed for each of these dependent claims because "*utilizing the technique taught by Steigerwald et al. and Marson et al.*" would supposedly "*increas[e] the efficiency of the power, reduc[e] cost and increas[e] availability.*"

However, the Examiner fails to provide any rational underpinnings for this combination. In particular, the Examiner fails to provide any explanation or evidence whatsoever that his proposed reasons for the combinations actually exist, that any of these benefits would accrue from any of the various modifications of Liu and Raets proposed for each of the claims 11-13, 17-18, 25-27 and 32-34, or that these benefits would have been recognized by one of ordinary skill in the art at the time that the

invention was made.

So the proposed combinations are all traversed.

Accordingly, for at least these reasons, Applicants respectfully submit that claims 11-13, 17-18, 25-27 and 32-34 are patentable over the cited art, and for the following additional reasons.

Claim 34

Among other things, the resonant converter of claim 34 includes a half-bridge drive circuit adapted to receive a signal from a regulating circuit and in response thereto to provide first and second control signals for switching the first and second switching elements.

Once again, Applicants respectfully submit that the Examiner fails to even mention this feature, and therefore has failed even to establish a *prima facie* case of obviousness under 35 U.S.C. § 103.

(4) Claims 23-24 and 28-30 Are All Patentable Over Liu, Steigerwald and Marson

At the outset, Applicants note that claims 23-24 and 28-30 all depend from claim 9. Applicants also submit that Steigerwald and Marson do not remedy the shortcomings of Liu as set forth above with respect to claim 9. Therefore, claims 23-24 and 28-30 are deemed patentable over any combination of Liu, Steigerwald and Marson for at least the reasons set forth above with respect to claim 9, and for the following additional reasons.

Applicants respectfully traverse the proposed modification of references as lacking any reason or suggestion in the art to make the modification. The Examiner states that it would have been obvious to modify Liu as proposed for each of these dependent claims because “utilizing the technique taught by Steigerwald et al. and Marson et al.” would supposedly “increas[e] the efficiency of the power” and “meet cost effectiveness and reliability.”

Again, it is well established that a rejection under 35 U.S.C. § 103 cannot be sustained merely by the conclusory statements of an Examiner. See M.P.E.P. §

2142, cited above.

The Examiner has provided no such articulated reasoning or rational underpinnings here, but instead only offered unsupported conclusory statements. In particular, the Examiner fails to provide any explanation or evidence whatsoever that his proposed reasons for the combinations actually exist, that any of these benefits would accrue from any of the various modifications of Liu and Raets proposed for each of the claims 23-24 and 28-30, or that these benefits would have been recognized by one of ordinary skill in the art at the time that the invention was made.

So the proposed combinations are respectfully traversed.

Accordingly, for at least these reasons, Applicants respectfully submit that claims 23-24 and 28-30 are patentable over the cited art .

CONCLUSION

For all of the foregoing reasons, Applicants submit that claims 5, 9, 11-13, 16-18, and 23-34 are all patentable over the cited prior art. Therefore, Applicants respectfully request that the rejections of claims 5, 9, 11-13, 16-18, and 23-34 be withdrawn, the claims be allowed, and the application be passed to issue.

Respectfully submitted,

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